Extron® Electronics

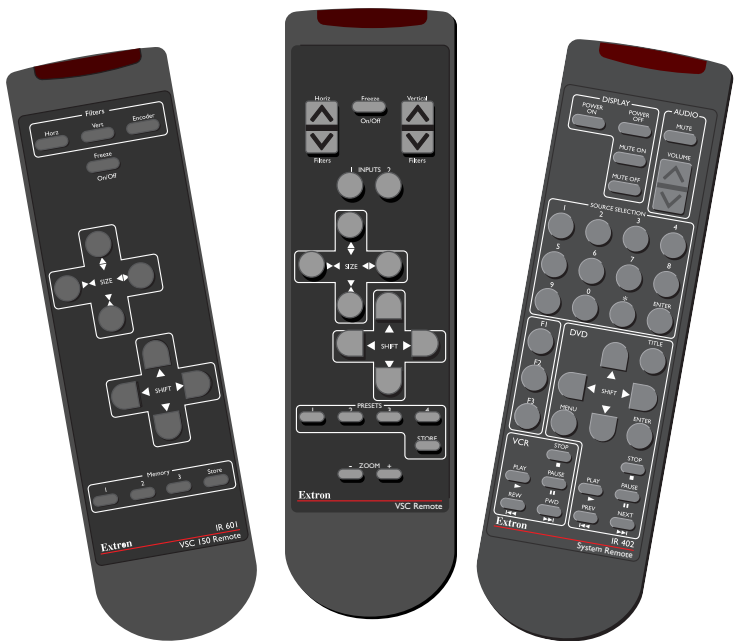INTERFACING, SWITCHING AND DISTRIBUTION

User's Guide

IR Remote Control
Hex Codes and Signal Timing

Guide to Hex Codes and Signal Timing for Extron IR Remote Controls
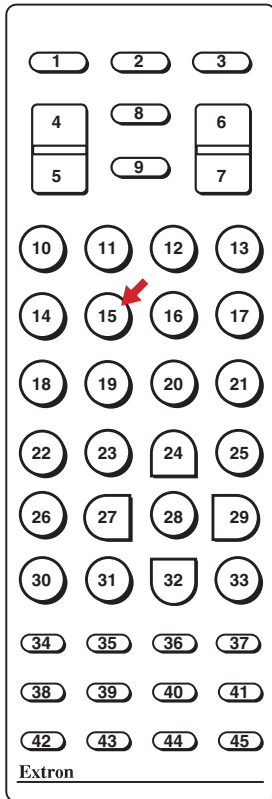
Hex codes

Looking up the Hex Code

To find the hex codes for your individual Extron IR remote control, match your button positions with those in figure 1, then look up the corresponding button number in the hex code table (e.g., button #15 [arrowed] has the hex code 0E).

NOTE   *Your remote control will not have all the buttons shown. Figure 1 below covers the button combinations of all available Extron IR remote models.*

Hex Code Table
(See left for button position)

Button #	Hex Code	Button #	Hex Code
1	00	25	18
2	01	26	19
3	02	27	1A
4	03	28	1B
5	04	29	1C
6	05	30	1D
7	06	31	1E
8	07	32	1F
9	08	33	40
10	09	34	41
11	0A	35	42
12	0B	36	43
13	0C	37	44
14	0D	38	45
15	0E	39	46
16	0F	40	47
17	10	41	48
18	11	42	49
19	12	43	4A
20	13	44	4B
21	14	45	4C
22	15		
23	16		
24	17		

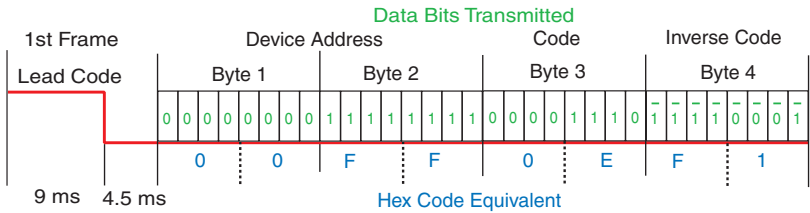*Figure 1 — IR Remote buttons and corresponding transmitted hex codes*

Explanation of Signal Timing

A complete command signal is made of a lead pulse, followed by 32 bits (4 bytes) of data, and a repeat pulse as long for as the button is held. The first two bytes contain the Extron device address (which is 00H FFH), the third byte contains the hex coded data (see the table above), and the fourth byte is the inverse of the third byte. The repeat pulse is sent to allow the receiver to know that the button is still being held.
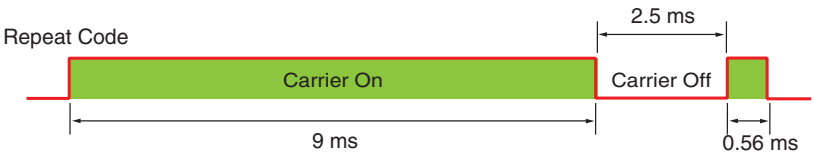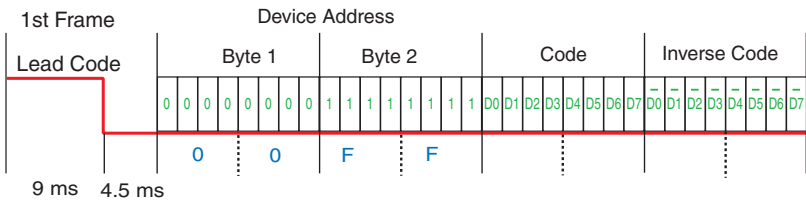
Signal Timing

Example

The figure below shows the transmitted signal to represent a single press of button #15.
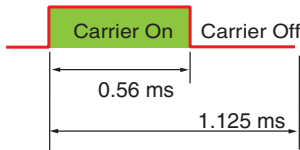
Data Bits Transmitted

1st Frame	Device Address		Code	Inverse Code
Lead Code	Byte 1	Byte 2	Byte 3	Byte 4

0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1	0 0 0 0 1 1 1 0	1̄ 1̄ 1̄ 1̄ 0̄ 0̄ 0̄ 1̄

| 0 | 0 | F | F | 0 | E | F | 1 |

9 ms   4.5 ms

Hex Code Equivalent

General Signal Timing with Code Positions

Carrier Frequency = 38 KHz
(50% duty cycle)

1st Frame	Device Address		Code	Inverse Code
Lead Code	Byte 1	Byte 2		

0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1	D0 D1 D2 D3 D4 D5 D6 D7	D̄0 D̄1 D̄2 D̄3 D̄4 D̄5 D̄6 D̄7

| 0 | 0 | F | F | | |

9 ms   4.5 ms

Repeat Code

Carrier On	Carrier Off

2.5 ms

9 ms   0.56 ms

Bit Description

Bit "0"

Carrier On	Carrier Off

0.56 ms
1.125 ms

Bit "1"

Carrier On	Carrier Off

0.56 ms
2.25 ms
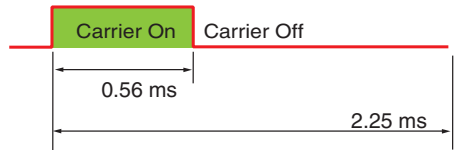
Frame Interval: Tf = The transmitted waveform as long as a key is depressed.

Tf = 108 ms   Tf = 108 ms

Lead Code   Bytes 1-4   Repeat Code   Repeat Code